ALTO®

AMERICAN-LINCOLN TECHNOLOGY

Operator's Manual & Parts List



114RS SWEEPER

Beginning with Serial No. 360498

READ THIS BOOK!

This book has important information for the use and safe operation of this machine. Failure to read this book prior to operating or attempting any service or maintenance procedure to your machine could result in injury to you or to other personnel; damage to the machine or to other property could occur as well. you must have training in the operation of this machine before using it. If you or your operator (s) cannot read English, have this manual explained fully before attempting to operate this machine.

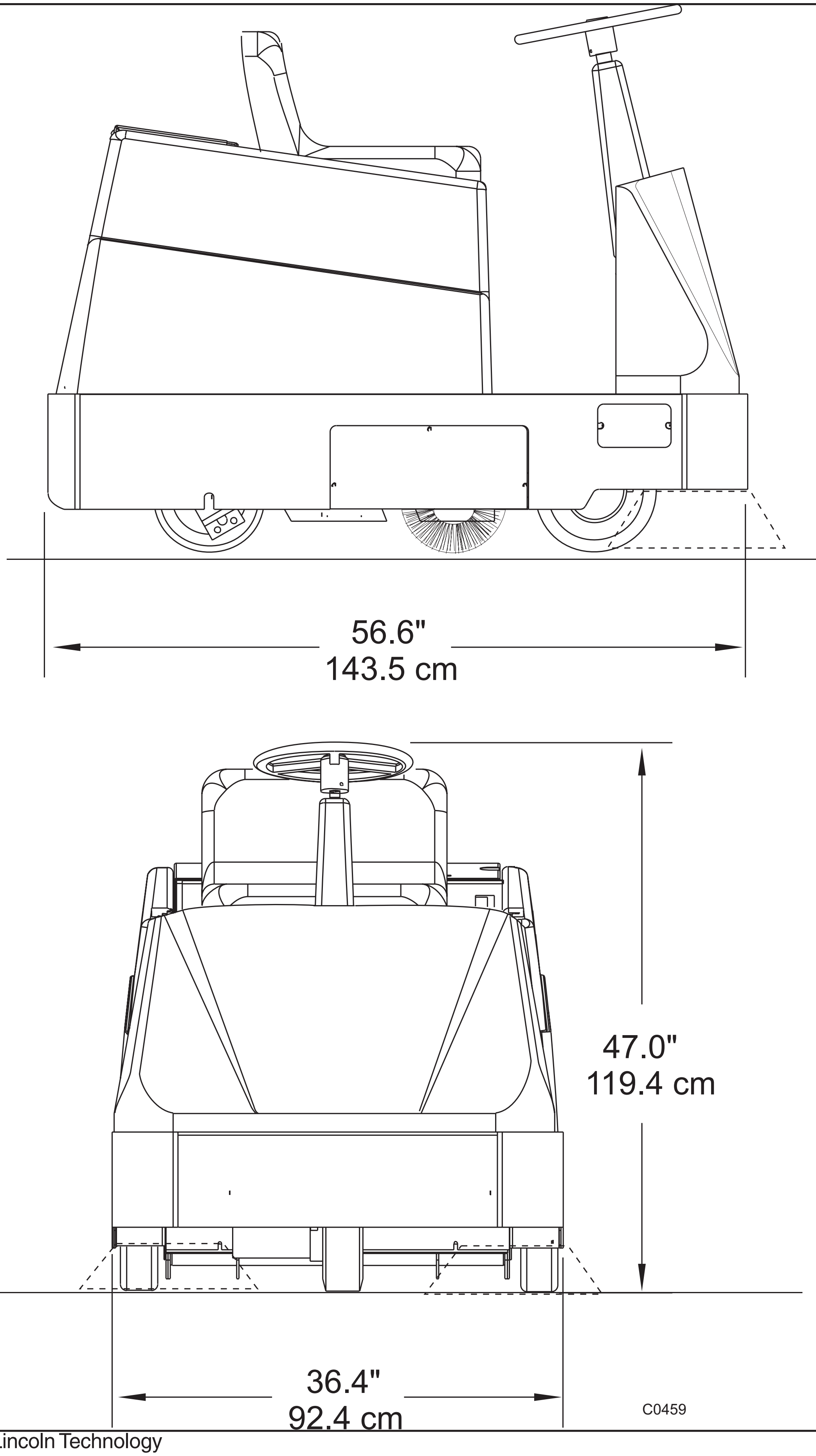
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FILE#A2287

All directions given in this book are as seen from the operator's position at the rear of the machine.

 Printed in the USA

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56.6"
143.5 cm
47.0"
119.4 cm
36.4"
92.4 cm
C0459

MACHINE SPECIFICATIONS

SWEEPING PATH	
Width	45.0 inches 114.3 cm. Including side brooms
TRAVEL SPEED	
Forward	4.0 MPH/4.9 KPH
Reverse	2.0 MPH/2.48 KPH
TURNING RADIUS	
Right	46.0 inches116.8 cm.
Left	46.0 inches116.8 cm.
U-turn Clearance	68.00 inches 172.7 cm.
DIMENSIONS	
Length	56.6 inches143.5 cm.
Width	36.4 inches 92.4 cm.
Height	47.0 inches119.4 cm.
WEIGHT	
Standard Machine	686 LBS .311 KGS (Without Batteries)
With 228 A.H. Batteries	1071 LBS.486 KGS
With 330 A.H. Batteries	1221 LBS.554 KGS
TIRES	
Type	Gray Non-Marking
Rear	3.0" wide x 10.0"dia. (7.6cm x 25.4cm) Foam Filled
Front	2.75" wide x 10.0" dia. (7.0 cm x 25.4 cm) Solid
BATTERIES	
Two 36 VDC Battery Package Options	
228 A.H.	Qty. 3 - 12 VDC Lead Acid Batteries Total Wt. 384 lb/175 kg
330 A.H.	Qty. 6 - 6 VDC Lead Acid Batteries Total Wt. 535 lb/243 kg
DRIVES	
Main Broom	(1) 0.50 HP 36 VDC Electric Motor (372 W.)
Side Brooms	(2) 0.13 HP 36 VDC Electric Motor (96.8 W.)
BRAKING	
For Operation	Dynamic braking to front wheel, using foot pedal.
For Storage or Service	Hand operated control to engage two rear wheel lock pins.
STEERING	
System Type	Single front wheel with chain and sprocket column
Steering Wheel Diameter	13 inches (33.02 cm)
Steering Angle of Front Wheel	180 degrees Available
LUBRICATION	
Rear Wheels	Grease Fittings Provided
Steering Gear	Grease Fittings Provided
WHEEL DRIVE SYSTEM	
Type	Front Wheel, Reversible Electric Coaxial Gear Motor
Rating	36 VDC .70 HP (500 W.)
MAIN BROOM	
Broom bristle mounted in a polycore tube with helical pattern bristle tufted in six double rows.	
Length	27.00 inches (68.6 cm)
Broom Size	11.00 inches (27.9 cm) Dia.
Broom bristle Length	3.00 inches (7.6 cm) long. (Usable to 1 Inch Length)

SIDE BROOMS

Polypropylene bristles mounted in a 1.25-inch (3.17-cm) thick marine grade varnished hardwood plate.

Broom Size	16 inches (40.6 cm) Dia.

HOPPER

Equipped with dolly wheels and handle.

Volumetric Capacity	3.0 cubic feet (85.0 lt)
Weight Capacity	375 lbs. (170 kg).

FILTRATION

One pleated treated paper type panel air filter.

Filtering area	40 square feet (3.7 m2)

VACUUM FAN

Electric motor is driving a radial impeller.

Motor	36VDC .62 HP (462W)
Impeller	9 inches (22.9 cm) Diameter

CONTROLS AND INSTRUMENTS

-Side Broom “Off” Switch
-Vac Fan “Off” Switch
-Push Button Filter Shaker
-Push Button Horn
-Control Handle for Main Broom Lift & Sweeping Settings. (Also turns off main & side brooms & vac impeller)
-Control Handle for Side Broom Lift
-Key Start Switch
-Single Pedal Control for Forward/Reverse Motion, Rate of Travel and Braking.
-Hour Meter
-Battery Condition Meter

OPTIONAL EQUIPMENT

- Strobe Light	- Back-up Alarm	- Low Battery Shutdown
- Emergency Stop	- Smart Battery Charger Option	
- Head, Tail Lights	- Over Head Guard	

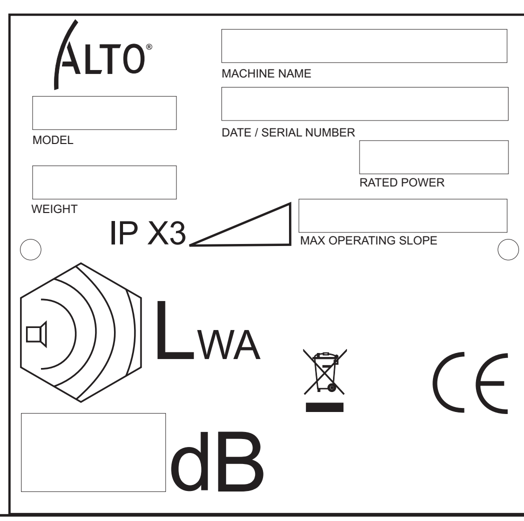
MAIN BROOM OPTIONS

-Nylon	-Nylon high density	-Proex

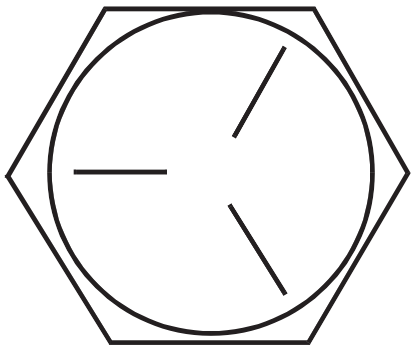
WARRANTY

Our general conditions of business are applicable with regard to the guarantee. Subject to change as a result of technical advances. The guarantee is invalidated if the machine is not operated in accordance with these instructions or otherwise abused. The guarantee is invalidated if the machine is not serviced as described.

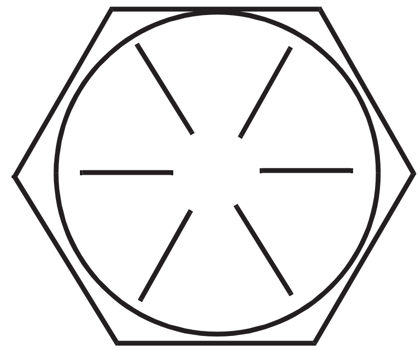
MACHINE DATA



BOLT IDENTIFICATION



SAE - Grade 5



SAE - Grade 8

Screw Size	Grade 5 Plated		Grade 8 Plated		410H Stainless		Brass	Type F & T & BT		Type B, AB
	C	F	C	F	C	F		C	F	
*6	14	15	-	-	18	20	5	20	23	21
*8	27	28	-	-	33	35	9	37	41	34
*10	39	43	-	-	47	54	13	49	64	49
*1/4	86	108	130	151	114	132	32	120	156	120
5/16	15	17	22	24	19	22	6	-	-	-
3/8	28	31	40	44	34	39	10	-	-	-
7/16	44	49	63	70	55	62	16	-	-	-
1/2	68	76	95	108	85	95	-	-	-	-
9/16	98	110	138	155	-	-	-	-	-	-
5/8	135	153	191	216	-	-	-	-	-	-
3/4	239	267	338	378	-	-	-	-	-	-
7/8	387	-	545	-	-	-	-	-	-	-
1	579	-	818	-	-	-	-	-	-	-

C = Coarse Thread
F = Fine Thread
* = Torque values for #6 through 1/4 are lb./in. All others are lb./ft.

NOTE

Decrease the torque by 20% when using thread lubricant
The torque tolerance is ± on torque values.

+

C2000/9905

DECIMAL METRIC CONVERSION TABLE

FRACTION	DECIMAL	MILLIMETER	FRACTION	DECIMAL	MILLIMETER
1/64	0.015625	0.3969	33/64	0.515625	13.0969
1/32	0.03125	0.7938	17/32	0.53125	13.4938
3/64	0.046875	1.1906	35/64	0.546875	13.8906
1/16	0.0625	1.5875	9/16	0.5625	14.2875
5/64	0.078125	1.9844	37/64	0.578125	14.6844
3/32	0.09375	2.3813	19/32	0.59375	15.0813
7/64	0.109375	2.7781	39/64	0.609375	15.4781
1/8	0.125	3.1750	5/8	0.625	15.8750
9/64	0.140625	3.5719	41/64	0.640625	16.2719
5/32	0.15625	3.9688	21/32	0.65625	16.6688
11/64	0.171875	4.3656	43/64	0.671875	17.0656
3/16	0.1875	4.7625	11/16	0.6875	17.4625
13/64	0.203125	5.1594	45/64	0.703125	17.8594
7/32	0.21875	5.5563	23/32	0.71875	18.2563
15/64	0.234375	5.9531	47/64	0.734375	18.6531
1/4	0.25	6.3500	3/4	0.75	19.0500
17/64	0.265625	6.7469	49/64	0.765625	19.4469
9/32	0.28125	7.1438	25/32	0.78125	19.8438
19/64	0.296875	7.5406	51/64	0.796875	20.2406
5/16	0.3125	7.9375	13/16	0.8125	20.6375
21/64	0.328125	8.3344	53/64	0.828125	21.0344
11/32	0.34375	8.7313	27/32	0.84375	21.4313
23/64	0.359375	9.1281	55/64	0.859375	21.8281
3/8	0.375	9.5250	7/8	0.875	22.2250
25/64	0.390625	9.9219	57/64	0.890625	22.6219
13/32	0.40625	10.3188	29/32	0.90625	23.0188
27/64	0.421875	10.7156	59/64	0.921875	23.4156
7/16	0.4375	11.1125	15/16	0.9375	23.8125
29/64	0.453125	11.5094	61/64	0.953125	24.2094
15/32	0.46875	11.9063	31/32	0.96875	24.6063
31/64	0.484375	12.3031	63/64	0.984375	25.0031
1/2	0.5	12.7000	1	1.0000	25.4000

C-2001/9907

SAFETY PRECAUTIONS

THE FOLLOWING STATEMENTS ARE USED THROUGHOUT THIS MANUAL AS INDICATED IN THEIR DESCRIPTIONS:

⚠ DANGER
To warn of immediate hazards which will result in severe personal injury or death.

⚠ WARNING
To warn of hazards or unsafe practices which could result in severe personal injury or death.

⚠ CAUTION
To warn of hazards or unsafe practices which could result in minor personal injury.

ATTENTION
To warn of unsafe practices which could result in extensive equipment damage.

NOTE
To give important information or to warn of unsafe practices which could result in equipment damage.

THE FOLLOWING INFORMATION SIGNALS POTENTIALLY DANGEROUS CONDITIONS TO THE OPERATOR OR EQUIPMENT. READ THIS MANUAL CAREFULLY. KNOW WHEN THESE CONDITIONS CAN EXIST. THEN, TAKE NECESSARY STEPS TO TRAIN MACHINE OPERATING PERSONNEL.

FOR THE SAFE OPERATION OF THIS MACHINE, READ AND UNDERSTAND ALL WARNINGS, CAUTIONS, AND NOTES.

⚠ WARNING
Machines can ignite flammable materials and vapors. Do not use with or near flammables such as: gasoline, grain dust, solvents, and thinners.

⚠ WARNING
Heavy machinery. Improper use can cause personal injury.

⚠ WARNING
Operate only when lids, doors, and access panels are securely closed.

⚠ WARNING
Use care when reversing machine in confined area.

⚠ WARNING
When servicing the machine, disconnect the batteries first to prevent possible injury.

⚠ WARNING
When working on the machine, empty hopper, remove batteries, clear area of people and obstructions, and use additional people and proper procedures when lifting the machine.

⚠ WARNING
Always empty the Hopper and Disconnect Battery before doing maintenance.

⚠ WARNING
You must have training in the operation of this machine before using it. READ THE INSTRUCTION BOOK.

⚠ WARNING
Do not operate this machine unless it is completely assembled.

⚠ WARNING
Do not use this machine as a step or furniture.

WARNING
Be careful when operating the machine on a ramp or incline. Always move slowly on a ramp. Do not turn this machine on a ramp. Do not stop and leave this machine on a ramp.

WARNING
Stop and leave this machine on a level surface. When you stop the machine, put the power switch in the "OFF" position and engage the Wheel Lock.

WARNING
To prevent injury, and damage to the machine, do not lift the machine or move it to an edge of a stair or loading dock.

WARNING
Lead acid batteries generate gases, which can cause an explosion. Keep sparks and flames away from batteries. NO SMOKING. Charge batteries only in area with good ventilation.

WARNING
Always wear eye protection and protective clothing when working near batteries. Remove all jewelry. Do not put tools or other metal objects across the battery terminals, or the tops of batteries.

WARNING
Maintenance and repairs must be done by authorized personnel only. Tighten all fasteners. Keep adjustments according to the specifications given in the service manual for the machine. Keep the electrical parts of the machine dry. For storage, keep the machine in a building.

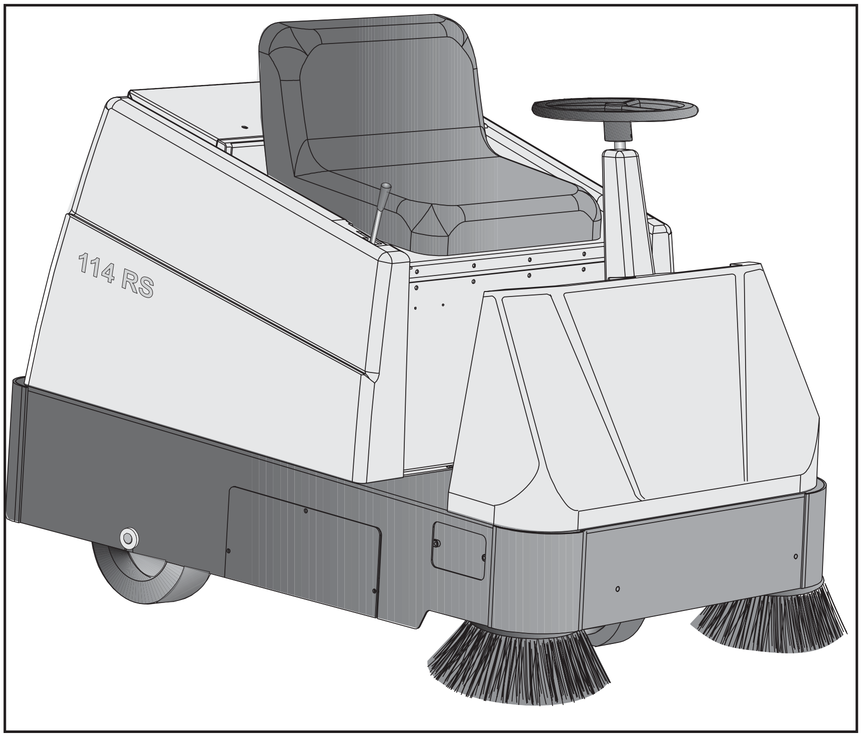
WARNING
Make sure that all labels, decals, warnings, cautions and instructions are fastened to the machine. Get new labels and decals from an Alto American-Lincoln distributor.

WEEE Symbol Information

ENGLISH



Correct Disposal of This Product (Waste Electrical & Electronic Equipment) (Applicable in the European Union and other European countries with separate collection systems)
This marking, shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.



C0458 FIGURE 1

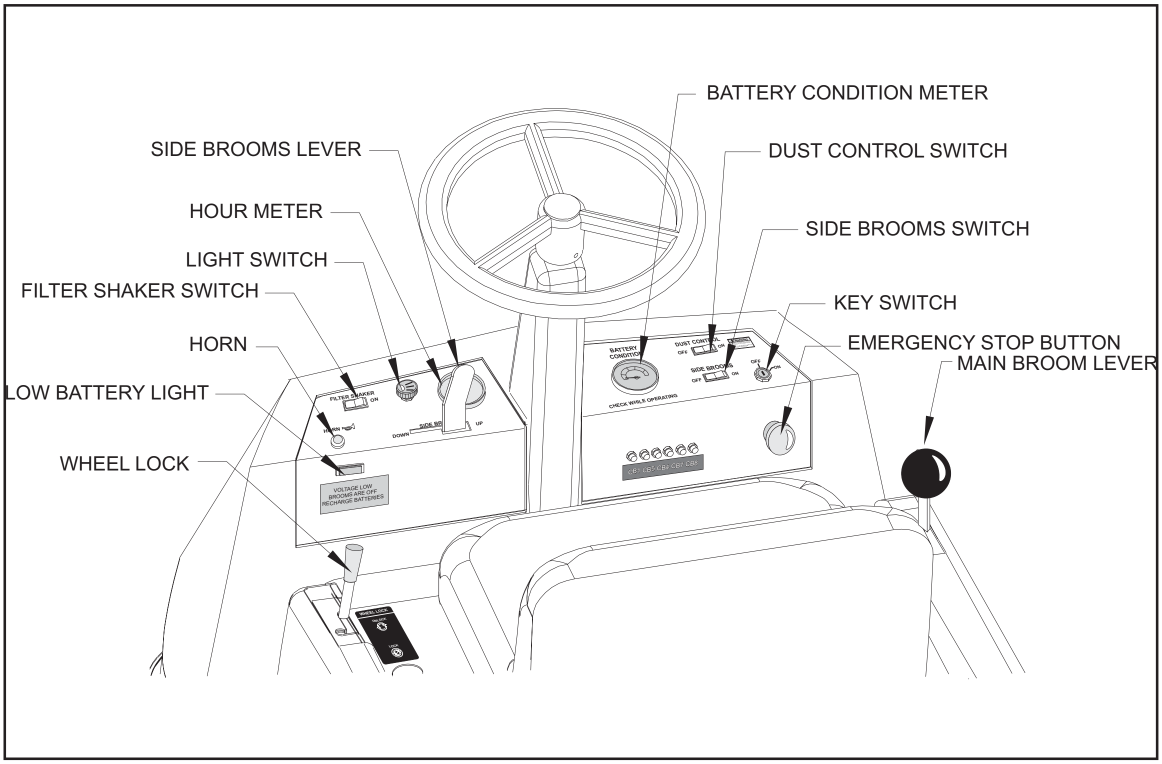
YOUR 114 RS BATTERY MACHINE HAS BEEN SHIPPED COMPLETE, BUT DO NOT ATTEMPT TO OPERATE WITHOUT READING THE FOLLOWING INSTRUCTIONS.

Uncrate the machine and remove all packing material. Inspect the machine for possible shipping damage. Install brooms, as outlined in the Service Instructions Section of this manual. Install batteries as follows (if not included):

1. Turn the key to the “OFF” position.
2. Unplug the polarized connector located next to the operator’s seat.
3. Lift the battery compartment cover and engage the safety latch.
4. Use a battery-lifting device with a 150 lb. (68 KG) capacity to place the batteries in the battery compartment.
5. Install Battery Cables. (See Page 45 for detailed connection information)
6. Charge batteries (See battery charging procedure in the Service Instructions Section of this Manual)
7. Disengage battery cover safety latch and carefully lower cover.
8. Plug the polarized connector into the receptacle located next to the operator’s seat.
9. READ THIS MANUAL before Attempting to Operate the Sweeper.

WARNING

Hydrogen gas is formed during the charging operation and is explosive! Only charge batteries in a well-ventilated area with the lid open. Avoid any open flame or electrical sparks. Pulling out the charger plug with the timer on will cause an arc and must be avoided.



C0461 FIGURE 2

KEY SWITCH - See Figure 2
The Key Switch turned to the right, the "ON" position, will provide power to all Sweeper systems.

HORN BUTTON - See Figure 2
The horn button is active only when the key switch is "on". Push the horn button to sound the horn.

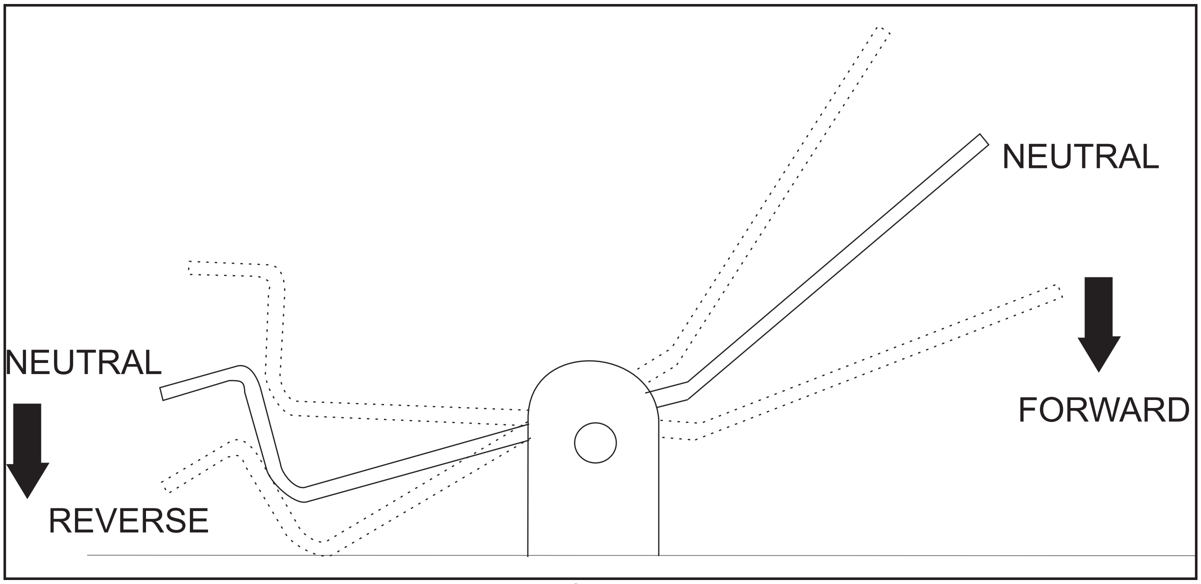
HOUR METER - See Figure 2
The hour meter is activated when the key switch is in the "On" position. The meter indicates the time, in Hours that the machine has been operated. This is useful for determining service intervals.

LIGHT SWITCH - See Figure 2
The Light Switch is a push-pull type switch that turns on the Front and Rear Lights. Pull the switch "out" to turn on the Lights. Push the switch "in" to turn off the Lights. The Lights are not controlled by the key switch and can be turned on regardless of the key switch position.

SEAT ADJUSTMENT
This lever is located on the right of the seat. This lever allows the seat to be adjusted forward or back when the lever is moved.

FILTER SHAKER SWITCH - See Figure 2
The filter shaker switch is a momentary on rocker type switch that when depressed and held shakes accumulated debris from the dust control filter. Press and hold the switch for 15 seconds to clear the filter. The filter should be cleared periodically while sweeping and prior to emptying the hopper.

SIDE BROOMS LIFT LEVER - See Figure 2
The Side Brooms Lift Lever is a two-position control that allows for Lifting or Lowering of the Side Brooms. Placing the lever to the left lowers the Side Brooms. Placing the lever to the right into the indent raises the Brooms.



P4066 FIGURE 3

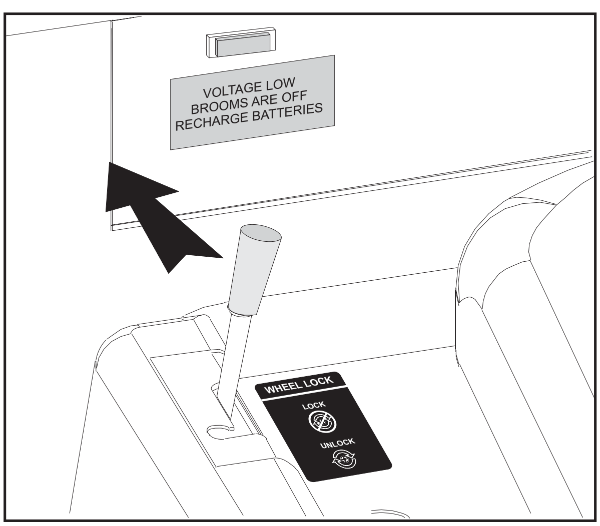
FOOT PEDAL-See Figure 3

The accelerator and directional control foot pedal is located on the floor of the operator's area. The accelerator and directional control pedal controls the machine direction, travel speed and dynamic braking. If the machine stops due to an electrical system overload in the power panel controller, allow the pedal to return to the neutral position. Reset is automatic when the controller cools.

For Forward Travel - Foot pressure on the upper portion of the pedal will cause the Sweeper to move forward. Increase the foot pressure on the upper portion of the pedal to increase the forward speed.

For Reverse Travel - Put foot pressure on the lower portion of the pedal. The machine will move in reverse. Increase the foot pressure on the lower portion of the pedal to increase the reverse speed.

To Stop the Sweeper - Allow directional control pedal to return to neutral (center position). Pedal will automatically return to centered position, which will automatically provide dynamic braking to stop. If Increased Braking action is desired put light foot pressure to the pedal in the opposite direction of travel until the sweeper stops then allow the pedal to return to center.



C0466 FIGURE 4

WHEEL LOCK - See Figure 4

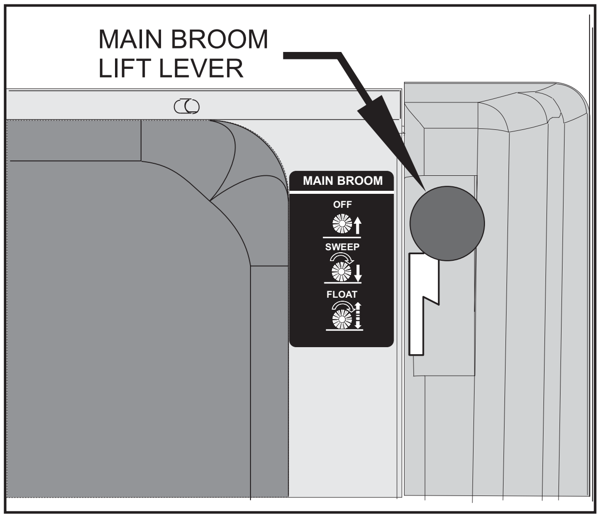
The Wheel Lock is used to prevent unexpected movement of the machine while it is "Parked" for Storage purposes or being serviced, such as emptying the hopper. The Wheel Lock is not to be used as a "Brake." To engage the wheel lock, Stop the Sweeper, move the lever out of the indent, and push it forward. The wheel lock will engage with the lever in the forward position.

WARNING

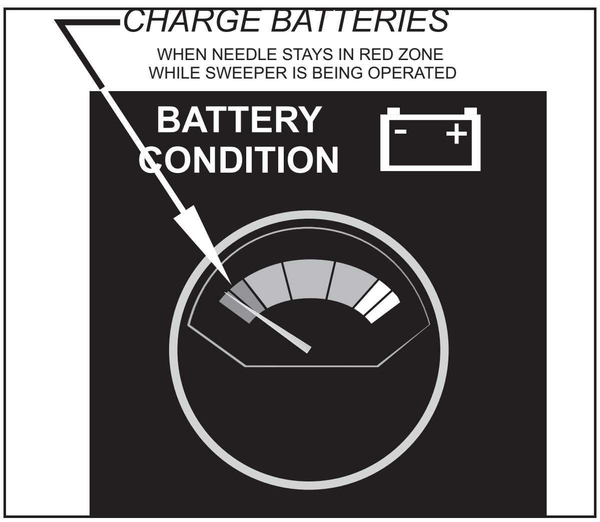
The Wheel Lock is not to be used as a "Brake." Make sure the sweeper has come to a complete stop before engaging the wheel lock. Personal Injury or Property Damage Can Result From Using the Wheel Lock as a "Brake."

WARNING

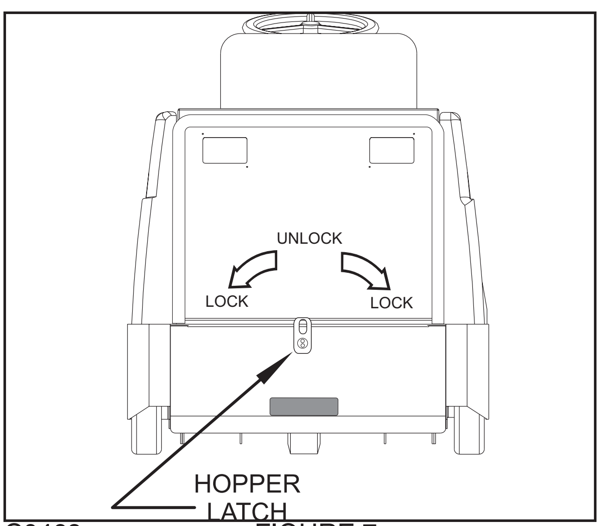
Turn the Key Switch "Off" and engage the Wheel Lock before Leaving the Operator's Compartment. Do Not Leave the Sweeper Unattended.



C0467 FIGURE 5



C0468 FIGURE6



C0469 FIGURE 7

MAIN BROOM LIFT LEVER - See Figure 5
The main broom lift lever is located on the right side next to the driver's seat. To lower the main broom, grasp the lever, move it to the left to clear the locking notch and pull back to the first or second notch. The first notch is the "Sweep" position, which is used for normal sweeping conditions, and will result in longer broom life. The second notch is the "Float" position and is used when sweeping very uneven surfaces. The main broom, side brooms and vacuum fan will start when the lever is moved from the "Off" position.

SIDE BROOMS SWITCH - See Figure 2
The Side Brooms Switch is a two-position rocker type On/Off Switch. Depress the right side of the switch to turn the side brooms on.

Depress the left side of the switch to turn the side brooms off. The side brooms will rotate when the Main Broom Lever is placed in the Sweep or Float Position.

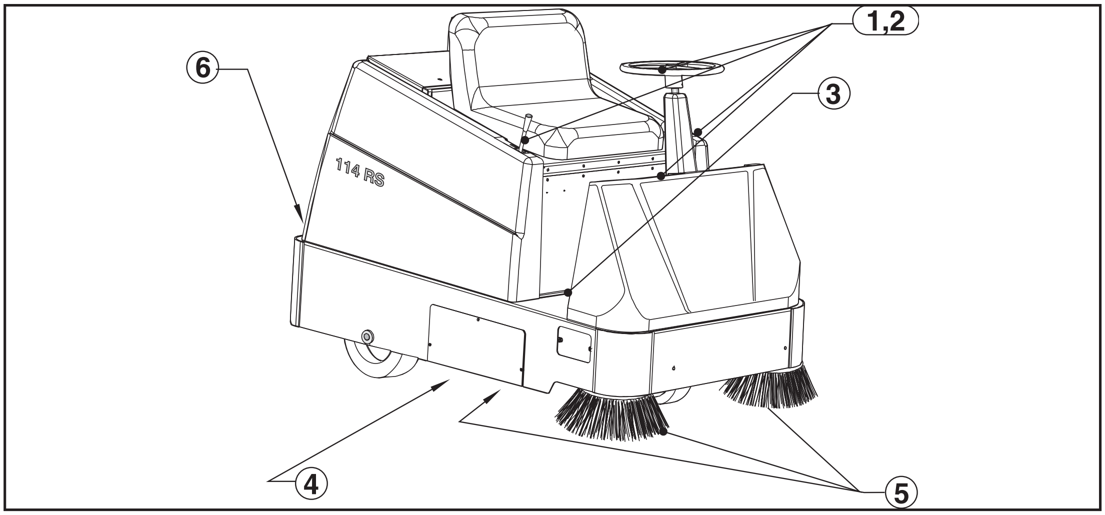
BATTERY CONDITION METER - See Figure 6
The meter shows the condition of the battery, while the machine is running, under load. Batteries are charged when indicator is in the green zone. When indicator stays in the red zone, batteries must be charged.

LOW BATTERY LIGHT (OPTION) - See Figure 2
The Low Battery Shutdown prevents excessive discharging of the batteries. When the batteries get low the indicator light comes on and the Brooms turn off. When the indicator light, illuminates Charge the batteries.

DUST CONTROL SWITCH - See Figure 2
The dust control switch is a two-position rocker switch located on the right instrument panel and is used to control operation of the vacuum fan for the dust control system. To turn on the vacuum fan, push the right side of the rocker switch. To turn off the vacuum fan push the left side of the rocker switch. The vacuum fan will only operate when the main broom lever is moved out of the "Off" position.

HOPPER RELEASE LATCH - See Figure 7
The Hopper Release Latch is located on the Hopper at the rear of the sweeper. To disengage the latch, turn the handle to the left to the nine O'clock positions. The Hopper is now ready to be removed. To engage the Hopper latch, ensure the hopper is properly seated and turn the handle to the right to the three O'clock position. You will feel the latch engage if the hopper is properly seated.

EMERGENCY STOP BUTTON (OPTION) - See Figure 2
The emergency stop button is a Red Mushroom switch, which is located near the key switch. To quickly shut down power to the machine, push the large red button. To reset the shut down button; first turn the red button clockwise in the direction of the arrows marked on the switch. Now turn the key switch to the "Off" position then clockwise to the "start" position, when you release the key switch and allow it to return to the "On" position the Sweeper will operate.



C0470 FIGURE 8

NOTE
Before starting, perform the pre-start checks.

PRE-START CHECKLIST - See Figure 8

1. Check controls for proper operation
2. Make sure all controls are in the “Off” position
3. Be sure accelerator / directional control pedal is in the neutral position.
4. Check all Dust flaps for damage or wear.
5. Check Main Broom and Side Broom for proper broom pattern.
6. Ensure that the hopper latch is properly engaged.

TO START MACHINE

1. Release the Wheel Lock.
2. Turn key to “On” position.

POST START CHECKLIST

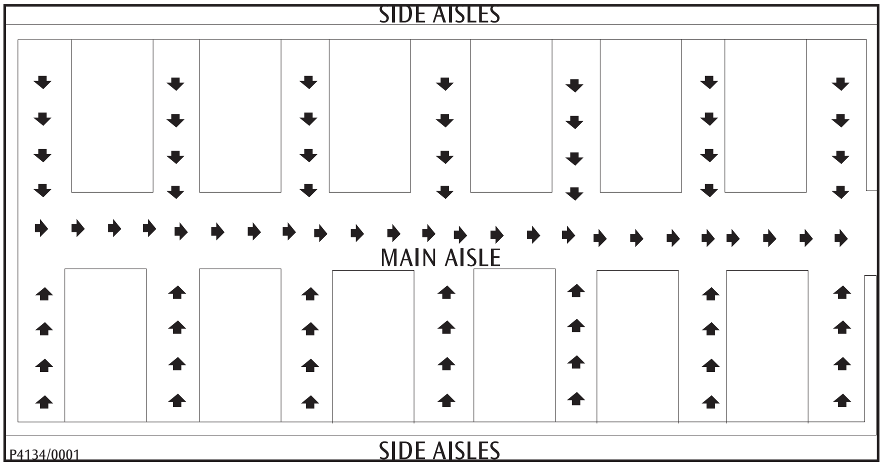
1. Check the Battery Condition Meter for sufficient battery charge. This must be done with the machine running.

TO TRANSPORT MACHINE

1. Be sure the Main Broom and Side Broom Controls are in the “UP” or “OFF” position with all other controls in the “OFF” position.
2. Push forward on the directional control pedal to place the machine in motion.
3. Vary your foot pressure on the directional control pedal to obtain desired travel speed.
4. To stop, allow directional control pedal to return to neutral (centered) position. (Pedal will automatically return to neutral when foot pressure is released).

TO BEGIN SWEEPING

1. Lower the Side Brooms by Moving the Side Broom Lift Lever to the “Down” Position.
2. Turn on the Side Brooms by setting the side brooms switch to the “On” Position.
3. Turn on the Dust control system by setting the Dust Control Switch to the “On” position.
4. Move the broom lift lever to the “Sweep” or “Float” position.
5. Vary your foot pressure on the directional control pedal to obtain desired travel speed.
6. To stop, allow directional control pedal to return to neutral (centered) position. (Pedal will automatically return to neutral when foot pressure is released).



P4134 FIGURE 9

HELPFUL HINTS FOR SWEEPING - See Figure 9

Here are some suggestions to keep in mind while sweeping.

1. Plan your sweeping in advance. Try to arrange long runs with minimum stopping and starting.
2. Pick up large debris before sweeping with the Machine.
3. Use the sweeper to sweep debris from side aisles into the main aisle.
4. After the Sweeper has made a sweeping run, turn off the dust control switch and use the filter shaker, Push and hold the shaker switch for approximately 15 seconds
5. Allow a few inches of overlap of sweep paths. This will eliminate leaving dirty patches.
6. Sweep in straight paths and do not bump posts or scrape the sides of the machine.
7. Periodically turn the sweeping broom end for end to prevent the bristles from “setting” in one direction.
8. Do not turn steering wheel too sharply when machine is in motion. The machine is very responsive to movement of the steering wheel - so avoid sudden turns.
9. As the Hopper becomes full, the sweeper will start to leave debris on the floor. When this occurs stop sweeping and empty the hopper.

TO EMPTY THE HOPPER

1. Place the Main Broom Lever in the “Off” position, raise Side Brooms, and proceed to the disposal site for emptying the Hopper.
2. Stop the Sweeper, Turn off the dust control switch and shake the filter for 15 seconds.
3. Place all controls in the “Off ” position and engage the wheel Lock.
4. Proceed to the rear of the Sweeper and unlock the Hopper latch.
5. Grasp the Hopper Handle and remove the hopper.
6. Dump the Hopper. Get Help if needed.
7. Position the Hopper and install it making sure that the Hopper goes in squarely.
8. Lock the Hopper Latch.
9. Resume Sweeping or perform the Post Operation Checklist if finished Sweeping.

TO STOP THE SWEEPING OPERATION

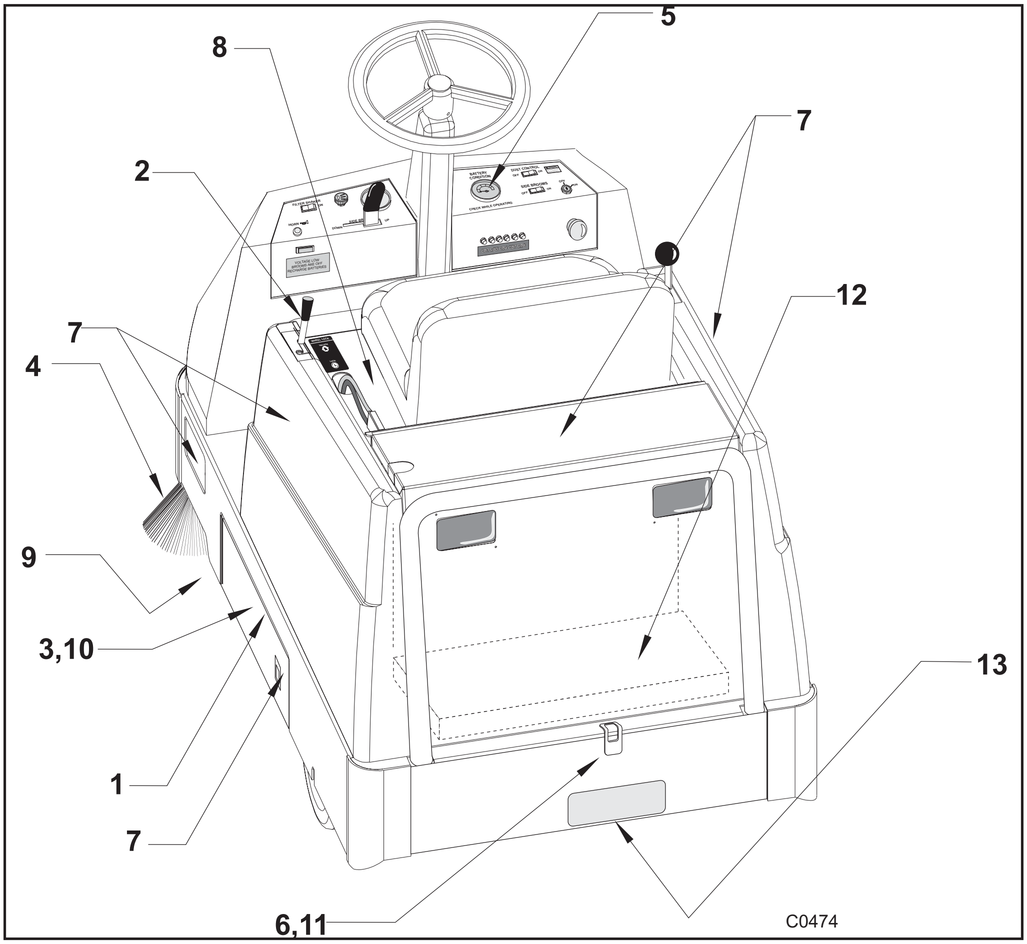
When the sweeping has been completed follow these instructions.

NOTE

After stopping, perform these post operation checks.

POST OPERATION CHECKLIST

1. Before turning off key switch, Check Battery Condition Meter.
2. Stop Machine and turn key switch to “Off” and Engage Wheel Lock.
3. Check all flaps for wear, damage, and adjustment.
4. Empty Hopper
5. Check Main Broom and Side Broom for wear or damage.
6. Charge Batteries if determined to be necessary in step 1 above.



C0474 FIGURE 10

SERVICE CHART FOR 114 RS

Check items for proper operation. If service is required, please consult your Clarke/American-Lincoln Authorized Distributor:

EVERY 8 HOURS or DAILY

1. All flaps for wear or damage.
2. Wheel Lock for proper operation.
3. Main Brooms for wear or damage.
4. Side Brooms for wear or damage.
5. Check Batteries and charge if necessary. (See Page 22 for Battery charging instructions)
6. Empty Hopper and ensure latch is properly secured.
7. All Hardware, Panels and Covers for tightness and security

50 HOUR MAINTENANCE CHECKLIST

8. Check battery electrolyte level.
9. Lubricate front wheel bearing and pivot.
10. Rotate Main Broom end for end to prevent uneven wear.

100 HOUR MAINTENANCE CHECKLIST

11. Clean Hopper.
12. Remove and Clean / Inspect Dust Control Filter. Replace if necessary
13. Lubricate Wheel lock pins.

For service assistance, consult your local Alto American-Lincoln Distributor. For best performance, replace worn parts with genuine American-Lincoln parts.

Refer all Maintenance and Service Requirements to Qualified Maintenance Personnel.

Do not attempt to Service this Machine until you have read and understand all Safety Warnings associated with the equipment you are working with.

WARNING
Electrical repairs must be done by authorized personnel only. Consult your American-Lincoln Authorized Service Person to do service procedures. Use only genuine American-Lincoln parts.

WARNING
Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

IMPORTANT
If towing or pushing is required, disconnect motor lead located on the terminal block on the bottom of the machine

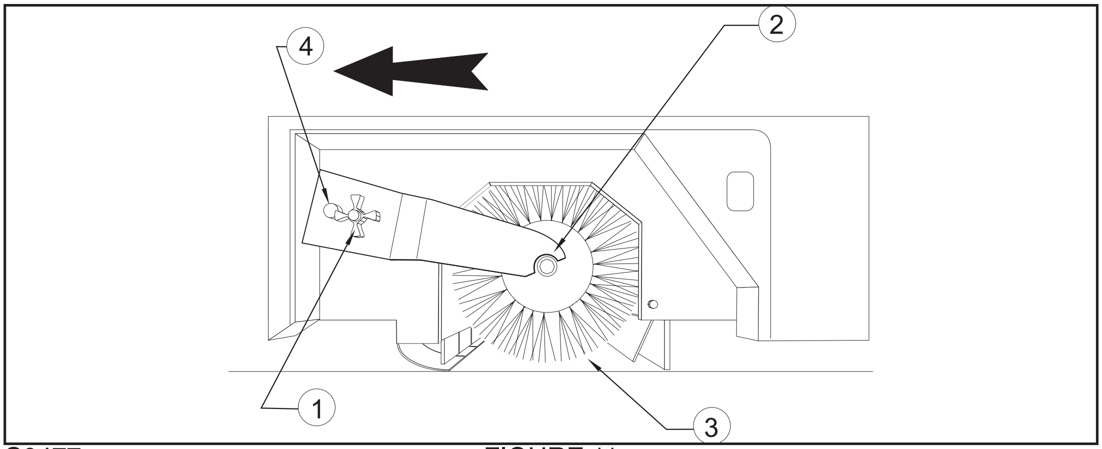
WARNING
Maintenance and repairs must be done by authorized personnel only. Always empty the Hopper and disconnect the batteries before doing any maintenance. Keep all fasteners tight. Keep adjustments according to the specifications as shown in the Service Manual for this machine.

WARNING
Always wear eye protection and protective clothing when working near batteries. Do not put tools or other metal objects across the tops of the batteries. NO SMOKING.

WARNING
To prevent damage to the machine and discharge across the tops of the batteries, do not fill the batteries above the bottom of the tube in each cell. Wipe any acid from the machine or the tops of the batteries. Do not add acid to a battery after installation.

WARNING
Always engage the safety latch before working under the Battery cover.

WARNING
Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch on will produce sparks and Could cause an Explosion.



C0477a FIGURE 11

MAIN BROOM SERVICE INSTRUCTIONS

TO CHECK THE MAIN BROOM SWEEP PATTERN

Check the main broom sweep pattern after changing the broom or when poor sweeping performance is encountered while sweeping.

1. While the machine is not moving, lower the main broom to the SWEEP position and let machine sweep in one spot for a short period.
2. Before moving machine, move main broom lever to the OFF position and move the sweeper forward until you can see the pattern left by the main broom bristles on the floor.
3. Check the width of the pattern on the floor to determine if the main broom requires adjustment.
   - A normal sweep pattern left on the floor will be between one and two inches wide.
   - A pattern that is more than two inches wide indicates the broom linkage needs to be adjusted “UP.”
   - A pattern that is less than one inch wide indicates the broom linkage needs to be adjusted “DOWN.”

WARNING

Always engage the safety latch before working under the Battery cover.

TO ADJUST THE MAIN BROOM SWEEP HEIGHT

When changing the sweep height adjustment it is recommended that the bolt be adjusted one turn at a time, After adjustment, recheck the sweep pattern to determine if further adjustment is necessary.

1. Gain access to the main broom height adjustment bolt by lifting the battery compartment cover, locking it in the up position and removing the right side panel cover.
2. Locate the Main Broom Height Adjustment bolt, which is located at the bottom of the Main Broom Lift linkage.(It will have a spring around it)
3. Turn the adjustment screw as described below.
   -Turn the adjustment bolt counterclockwise to INCREASE the sweep pattern width.
   -Turn the adjustment screw clockwise to DECREASE the sweep pattern width.

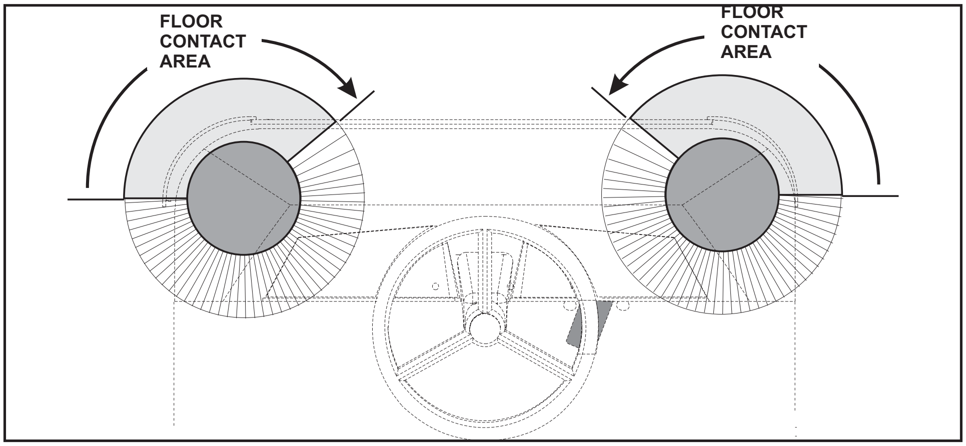
WARNING

Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO CHANGE THE MAIN BROOM [See Figure 11]

Replace the main broom when the bristles become worn to 1-inch length.

1. Park the sweeper on a smooth level surface and engage the wheel lock.
2. Gain access to the main broom by opening the left-hand side broom compartment door.
3. Remove the Main broom Idler hub [Item 2] by loosening the threaded knob [Item 1].
4. Grasp the Main Broom [Item 3] and remove it from the drive hub. [Item 2].
5. Insert Replacement Broom [Item 3] Into the broom compartment. Pay special attention to the slots on the broom, it may be necessary to rotate the broom so the tabs on the drive hub align with the slots on the broom.
6. Reinstall the idler hub [Item 2] to the broom and over the locator stud [Item 4] and screw provided for the threaded knob [Item 1].
7. Install the threaded knob and close the Broom Door.
8. Recheck Main Broom Sweep Pattern.



C0472 FIGURE 12

SIDE BROOMS SERVICE INSTRUCTIONS

The Side Brooms Sweeping angle is not adjustable however the height of the side brooms can be adjusted to compensate for wear as the brooms become worn from use. Two access panels need to be removed to make the Side Broom Height adjustment.

TO CHECK THE SIDE BROOM SWEEP PATTERN

1. Park the machine on a smooth level surface and turn the Side Broom Switch to the “ON” position.
2. Place the Side Broom Lift Lever in the “DOWN” position.
3. Move the Main Broom Lever to the “SWEEP” position.
4. While staying in place, allow the side brooms to sweep for a short period. (Allow enough time for the side brooms to leave a clean footprint on the floor).
5. Place the Side Broom Lift Lever in the “UP” position.
6. Turn the Side Broom Switch to the “OFF” position.
7. Move the Main Broom Lever to the “OFF” Position.
8. Back the sweeper away from the area where the Pattern was left.
9. Turn Key Switch to the “OFF” position and engage Wheel Lock.
10. Leave operator’s compartment and check the Pattern to determine the Floor Contact area.
11. Determine if adjustment to the side brooms height is necessary by comparing the floor contact area to the diagram in figure 12.

WARNING

Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO CHANGE THE SIDE BROOMS HEIGHT ADJUSTMENT

1. Park Machine on a smooth level surface, turnkey switch to “OFF” Position and engage Wheel Lock.
2. Place the Side Brooms Lift Lever in the “DOWN” Position.
3. Remove the two access panel screws and remove panel.
4. Loosen the four bolts that pass through the slots in the side broom motor lift bracket.
5. Lower the side broom motor in the slots so the broom contacts the floor as shown. (See figure 12)
6. Tighten the four bolts and recheck the sweep pattern.
7. Reinstall the access panels when proper adjustment has been achieved.

TO CHANGE THE SIDE BROOMS

Change the side brooms when the bristles become worn to less than 3 inches length.

1. Park Machine on a smooth level surface, turnkey switch to “OFF” Position and engage Wheel Lock.
2. Place the side brooms lever in the “DOWN” Position.
3. Remove the three (3) ¼ inch bolts and nuts that hold the broom to the motor flange.
4. Install the replacement Broom and fasten using the hardware removed in step 3.

DUST CONTROL SYSTEM SERVICE INSTRUCTIONS

The Dust Control system consists of a Filter Baffle and a Panel Filter. The filter baffle is located under the dust control filter and should be checked/cleaned when the hopper is being emptied. The Panel Filter is located in the rear compartment behind the seat.

WARNING

Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO CLEAN THE FILTER BAFFLE

The filter baffle should be cleaned as a first step when the dust control system fails to effectively control dusting while sweeping.

1. Park the sweeper on a smooth level surface, Turn the key switch to the “OFF” position and engage the wheel lock.
2. Disconnect the Battery Connector, which is located next to the seat.
3. Remove the hopper.
4. Lower the baffle and inspect for debris lodged in the baffle passages.
5. Dislodge all debris from the baffle manually or with compressed air not to exceed 100 PSI.
6. Raise the baffle. Making sure the baffle “Locks” into place.
7. Reinstall the hopper.
8. Reconnect the Battery and return the Sweeper to service.

WARNING

Always engage the safety latch before working under the Battery cover.

WARNING

Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch on will produce sparks and Could cause an Explosion.

TO CLEAN THE PANEL FILTER

Clean the Panel filter when the shaker fails to adequately clear the filter pleats.
(Refer to page 39 for detailed assembly drawing)

1. Park the sweeper on a smooth level surface, Turn the key switch to the “OFF” position, and engage the wheel lock.
2. Disconnect the Battery Connector, which is located next to the seat.
3. Raise the Battery compartment cover and engage the safety latch.
4. Remove the rear cover.
5. Locate and remove the four wing nuts that hold the filter manifold assembly in place over the filter.
6. Disconnect the shaker motor leads and the Vac fan leads and lift the Vac Fan/Manifold assembly off thedust filter.
7. Remove the filter and blow the dust off the filter with compressed air not to exceed 100 PSI
8. Reinstall the cleaned filter and assemble the Vac Fan/Manifold Assembly to the filter.
9. Connect the shaker motor leads and the Vac fan leads.
10. Install the four Wing Nuts and tighten enough to lightly compress the gasket on the filter.
11. Reinstall the Rear cover and lower the Battery Compartment cover.
12. Reconnect the Battery and return the Sweeper to service.

WARNING

Always engage the safety latch before working under the Battery cover.

WARNING

Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch “on” will produce sparks and Could cause an Explosion.

WARNING

Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO CHANGE THE PANEL FILTER

Change the filter when obvious damage is evident, Inspect for leakage or a heavily loaded filter to the point that cleaning and shaking of the filter has no effect on clearing the pleats.

TO CHANGE THE PANEL FILTER - Cont.

1. Park the sweeper on a smooth level surface, Turn the key switch to the “OFF” position and engage the wheel lock.
2. Disconnect the Battery Connector, which is located next to the seat.
3. Raise the Battery compartment cover and engage the safety latch.
4. Remove the rear cover.
5. Locate and remove the four wing nuts that hold the filter manifold assembly in place over the filter.
6. Disconnect the shaker motor leads and the Vac fan leads and lift the Vac Fan/Manifold assembly off thedust filter.
7. Remove and replace the dust filter.
8. Reinstall the cleaned filter and assemble the Vac Fan/Manifold Assembly to the filter.
9. Connect the shaker motor leads and the Vac fan leads.
10. Install the four Wing Nuts and tighten enough to lightly compress the gasket on the filter.
11. Reinstall the Rear cover and lower the Battery Compartment cover.
12. Reconnect the Battery and return the Sweeper to service.

FLAP SERVICE INSTRUCTIONS

The Flaps are very important to the sweeping process. Inspect the Flaps Daily and replace any flap that shows signs of wear or deterioration. The drive wheel and side flaps are adjustable and should be adjusted so there is a recommended 1/16" to 1/8" gap between the floor and the bottom edge of the flaps. The adjustable flaps have slotted mounting holes to facilitate adjustment. The Recycling flap is also an adjustable flap and should be adjusted so the flap touches the broom. The adjustment bolt is located inside the left side broom chamber door. All other flaps require no adjustment and should be replaced when worn or damaged.

WARNING

Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch on will produce sparks and Could cause an Explosion.

WARNING

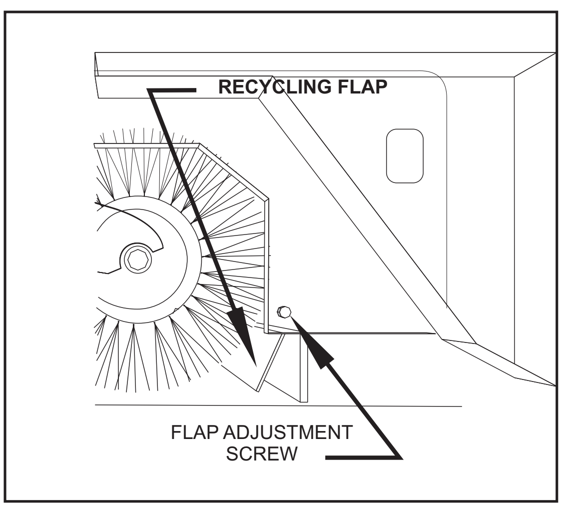
Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO ADJUST THE DRIVE WHEEL AND SIDE FLAPS

1. Park Sweeper on a smooth level surface. Turn the key switch to the “OFF” position and engage the wheel lock.
2. Disconnect the Battery Connector located next to the seat.
3. Loosen the Flap retaining screws and adjust the flap to clear the floor and leave a 1/16" to 1/8" Gap.
4. Tighten Flap retaining screws while holding flap in position.
5. Reconnect the Battery Connector.

WARNING

Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch on will produce sparks and Could cause an Explosion.



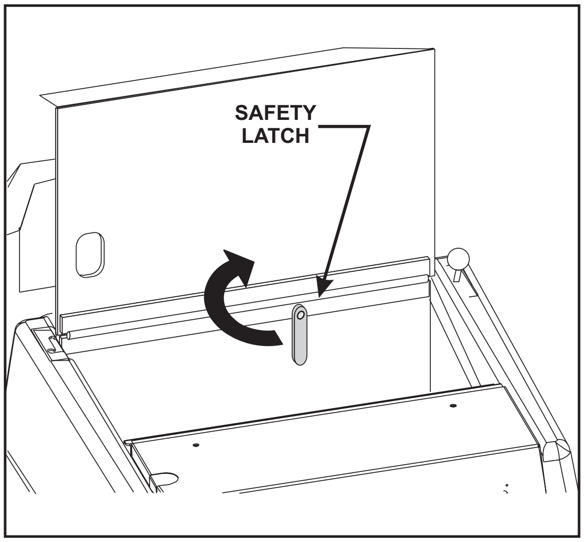
C0477b FIGURE 13

WARNING

Always park on a level surface, turn key off, and engage wheel lock before working on the machine to keep it from creeping or rolling.

TO ADJUST THE RECYCLING FLAP

1. Park Sweeper on a smooth level surface. Turn the key switch to the “OFF” position and engage the wheel lock.
2. Disconnect the Battery Connector located next to the seat.
3. Open the left side broom door and locate the recycling flap adjustment screw (See Figure 13)
4. Loosen the adjustment screw and turn the flap upwards so the flap touches the ends of the broom bristles.
5. Tighten the adjustment screw while holding the flap in place.
6. Close and Latch the left side broom door Reconnect the Battery.



C0471 FIGURE 14

BATTERY SERVICE INSTRUCTIONS
TO CHARGE THE BATTERIES

1. Ensure Wheel Lock is engaged and key switch is "Off".

WARNING
Turn Key Off Before removing Battery Connector. Disconnecting the Battery with the key switch on will produce sparks and Could cause an Explosion.

WARNING
Always wear eye protection and protective clothing when working near Batteries.

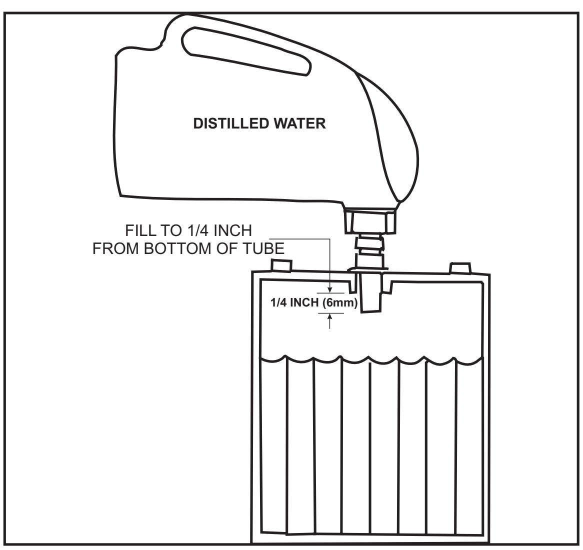
WARNING
Remove all Jewelry and do not lay tools etc. across the tops of Batteries. Batteries produce Explosive Hydrogen Gas. Keep Sparks and Flames away from Batteries. NO SMOKING.

WARNING
Always engage the safety latch before working under the Battery cover.

2. Disconnect Machine Battery Connector.
3. Raise Battery Cover and engage Safety Latch. (See Figure 14)
4. Insert charging plug into battery receptacle.
5. Plug power cord into proper AC source.
6. Leave battery cover open while charging.
7. Follow the charging instructions provided on the Charger.
8. Maintain electrolyte level in batteries check after charging. Add distilled water as needed (See Figure15)

WARNING
Hydrogen gas is formed during the charging operation and is explosive! Only charge batteries in a well-ventilated area with the lid open. Avoid any open flame or electrical sparks. Pulling out the charger plug with the Charger on will cause an arc and must be avoided.

WARNING
Batteries are heavy. Use two people to lift the batteries.

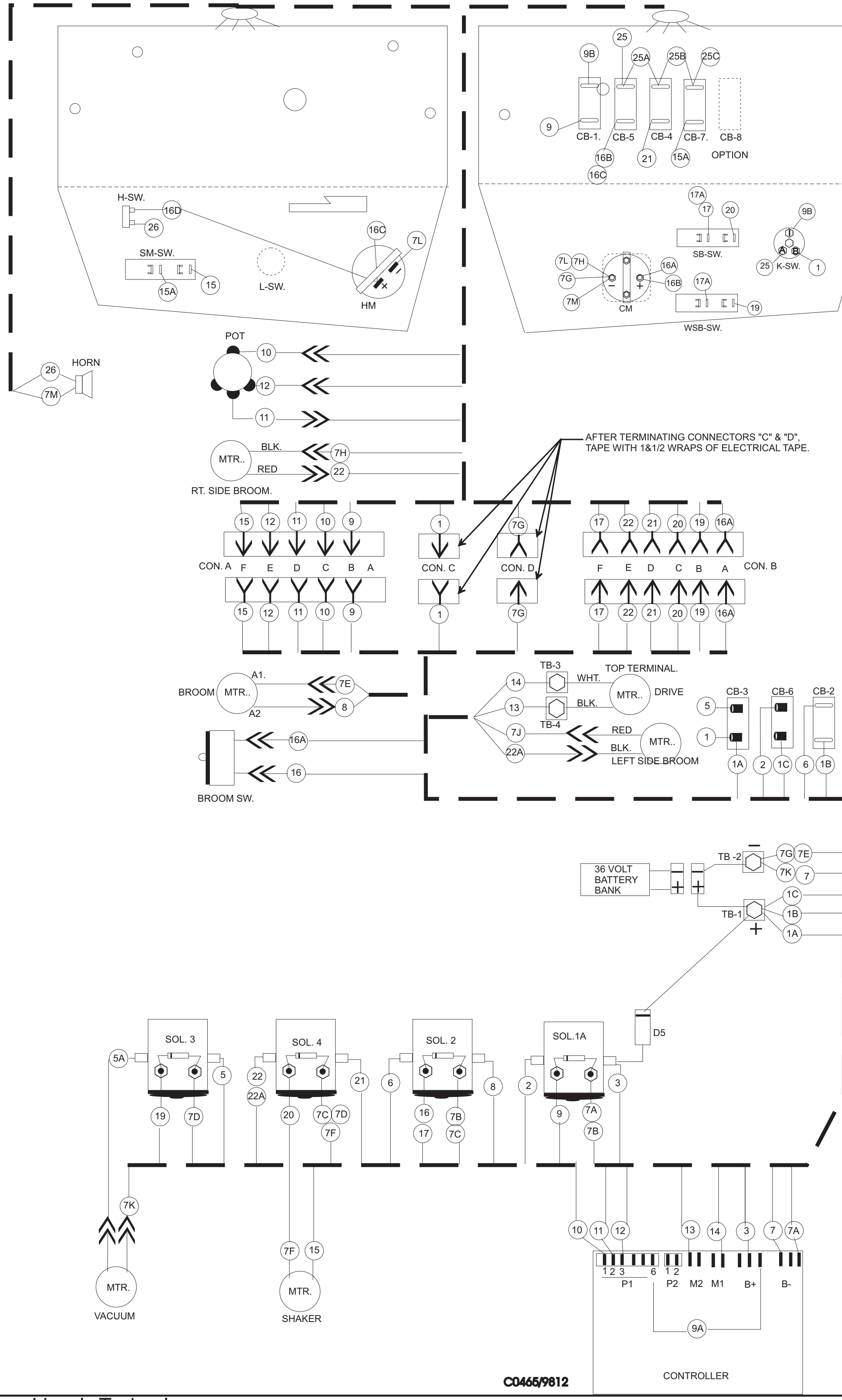


P4074 FIGURE 15

WARNING
Always engage the safety latch before working under the Battery cover.

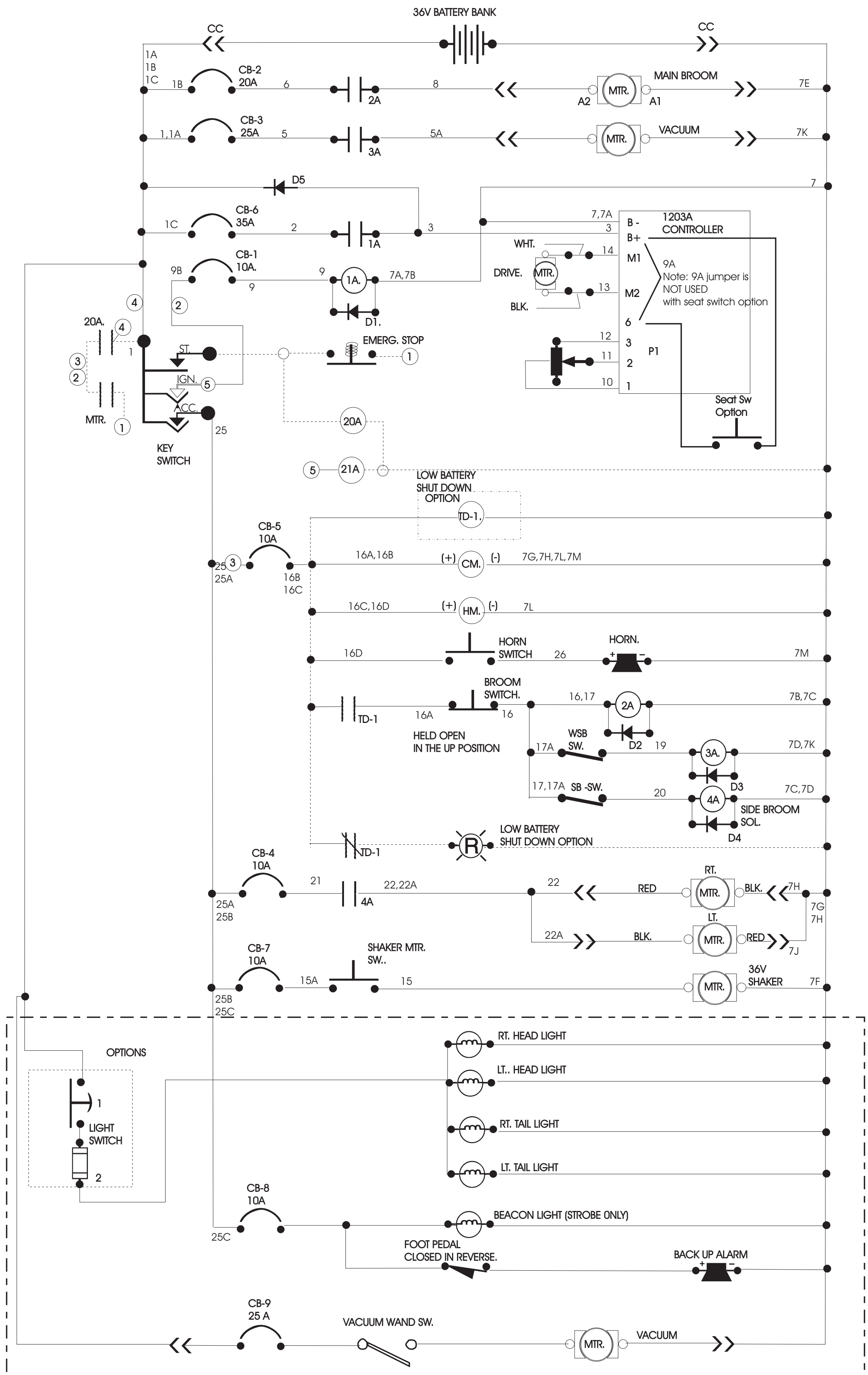
TO REMOVE THE BATTERIES

1. Turn Key Switch "Off" and engage the wheel lock.
2. Unplug the battery connector located next to the operator's seat.
3. Raise the battery compartment cover and engage the Safety Latch.(See Figure 14)
4. Disconnect the Battery Cables.
5. Lift the Batteries out one at a time.



H-SW.
SM-SW.
L-SW.
HM
CB-1.
CB-5
CB-4
CB-7.
CB-8
OPTION
SB-SW.
K-SW.
CM
WSB-SW.
POT
HORN
MTR..
BLK.
RED
RT. SIDE BROOM.
AFTER TERMINATING CONNECTORS "C" & "D",
TAPE WITH 1&1/2 WRAPS OF ELECTRICAL TAPE.
CON. A
CON. C
CON. D
CON. B
BROOM
A1.
A2
TB-3
TB-4
WHT.
BLK.
TOP TERMINAL.
DRIVE
LEFT SIDE BROOM
BROOM SW.
CB-3
CB-6
CB-2
36 VOLT
BATTERY
BANK
TB -2
TB-1
D5
SOL. 3
SOL. 4
SOL. 2
SOL.1A
VACUUM
SHAKER
P1
P2
M2
M1
B+
B-
CONTROLLER
C0465/9812

SCHEMATIC DIAGRAM



ABBREVIATIONS - SCREWS

ADJ	=	Adjusting Screw
ADJ.SP	=	Adjusting Plunger Screw
BHM	=	Binding Head Machine Screw
BHS	=	Button Head Socket Screw
CAPT.SL	=	Captivated Slotted Screw
CAPT.WG	=	Captivated Wing Screw
FHM	=	Flat Head Machine Screw
FIL.HM	=	Filister Head Machine Screw
HHC	=	Hexagon Head Cap Screw
HHM	=	Hexagon Head Machine Screw
HIHD	=	1/2 High Head Screw
HSHC	=	Hexagonal Socket Head Cap Screw
HSFHC	=	Hexagonal Socket Flat Head Cap Screw
KNH	=	Knurled Head Screw
MHHC	=	Metric Hexagon Head Cap Screw
PHM	=	Pan Head Machine Screw
RHD	=	Round Head Drive Screw
RHM	=	Round Head Machine Screw
RHW	=	Round Head Wood Screw
SHC	=	Shiny Crown Cap Screw
SHTB	=	Shoulder Thumb Screw
SQ	=	Square Head Screw
TB	=	Thumb Screw
THM	=	Truss Head Machine Screw
WELD	=	Weld Stud
WG	=	Wing Screw

ABBREVIATIONS - SETSCREWS

HS	=	Hexagonal Socket Setscrew
S	=	Slotted Setscrew
SH	=	Square Head Setscrew
-KCP	=	Knurled Cup Point Setscrew
-CP	=	Cup Point Setscrew
-OP	=	Oval Point Setscrew
-FDP	=	Full Dog Point Setscrew
-HDP	=	Half Dog Point Setscrew
-FP	=	Flat Point Setscrew
-COP	=	Cone Point Setscrew

ORDERING PARTS

INTERNET
http://www.alto-online.com

ALTO HEADQUARTERS
Incentive International A/S
Kongens Nytorv 28
P.O. Box 2064
1013 Copenhagen K
Tel.: +45 72 18 10 00
Fax: +45 72 18 11 64
E-mail: incentive@incentive-dk.com

SUBSIDIARIES

AUSTRALIA
ALTO Overseas Inc.
1B/8 Resolution Drive
P.O. Box 797
Caringbah, N.S.W.2229
Tel.: +61 2 95 24 61 22
Fax: +61 2 95 24 52 56

AUSTRIA
ALTO Österreich GmbH
Metzgerstr. 68
5101 Bergheim/Salzburg
Tel.: +43 6624 5 64 00-14
Fax: +43 6624 5 64 00-55
E-mail: wap@salzburg.co.at

BRAZIL
Wap do Brasil Ltda.
Rua 25 de Agosto, 608
83323-260 Pinhais/Paraná
Tel.: +55 4 12 10 67 40 0
Fax: +55 4 12 10 67 40 3
E-mail: wap@wapdobrazil.com.br

CANADA
ALTO Canada
24 Constellation Road
Rexdale, Ontario M9W 1K1
Tel.: +1 416 6 75 58 30
Fax: +1 416 6 75 69 89

CROATIA
Wap ALTO Strojevi za čišćenje, d.o.o.
Siget 18a
10020 Zagreb
Tel.: +385 1 65 54 144
Fax: +385 1 65 54 112
E-mail: admin.wap@wap-sistemi.hr

CZECH REPUBLIC
ALTO Ceská Republika s.r.o.
Zateckych 9
14000 Praha 4
Tel.: +420 2 41 40 84 19
Fax: +420 2 41 40 84 39
E-mail: wap_p@mbox.vol.cz
Web: www.wap-alto.cz

DENMARK
ALTO Danmark A/S
Industrikvarteret
9560 Hadsund
Tel.: +45 7218 21 00
Fax: +45 7218 21 05
E-mail: salg@alto-dk.com

FRANCE
ALTO France S.A.
B.P. 44, 4 Place d'Ostwald
67036 Strasbourg Cedex 2
Tel.: +33 3 88 28 84 00
Fax: +33 3 88 30 05 00
E-mail: info@alto-fr.com

GERMANY
ALTO Deutschland GmbH
Guido-Oberdorfer-StraBe 2-8
89287 Bellenberg
Tel.: +49 0180 5 37 37 37
Fax: +49 0180 5 37 37 38
E-mail: info@wap-online.de

GREAT BRITAIN
ALTO Cleaning Systems
(UK) Ltd.
Bowerbank Way
Gilwilly Industrial Estate, Penrith
Cumbria CA11 9BN
Tel.: +44 1 7 68 86 89 95
Fax: +44 1 7 68 86 47 13
E-mail: sales@alto-uk.com

NETHERLANDS
ALTO Nederland B.V.
Postbus 65
3370 AB Hardinxveld-Giessendam
Tel.: +31 18 46 77 20 0
Fax: +31 18 46 77 20 1
E-mail: info@alto-nl.com

NORWAY
ALTO Norge A/S
Bjørnerudveien 24
1266 Oslo
Tel.: +47 22 75 17 70
Fax: +47 22 75 17 71
E-mail: info@alto-no.com

SINGAPORE
ALTO DEN-SIN Singapore Pte Ltd.
No. 17 Link Road
Singapore 619034
Tel.: +65 62 68 10 06
Fax: +65 62 68 49 16
E-mail: densin@singnet.com.sg
Web: www.densin.com

SLOVENIA
Wap ALTO čistilni sistemi, d.o.o.
Letališka 33
SLO-1110 Ljubljana
Tel.: +368 15 20 62 00
Fax: +368 15 20 62 10
E-mail: wap@siol.net

SLOWAKIA
Wap ALTO čistiace systémy s.r.o.
Remeselnicka 42
83106 Bratslavia-Rača
Tel.: +421 2 44 881 402
Fax: +421 2 44 881 395
E-mail: wap@gtinet.sk
Web: www.wap-alto.sk

SPAIN
ALTO Iberica S.L.
Calle de la Majada No. 4
28760 Tres Cantos - Madrid
Tel.: +34 91 8 04 62 56
Fax: +34 91 8 04 64 63
E-mail: info@alto-es.com

SWEDEN
ALTO Sverige AB
Aminogatan 18
431 04 Mölndal
Tel.: +46 3 17 06 73 00
Fax: +46 3 17 06 73 41
E-mail: info@alto-se.com

USA
ALTO Cleaning Systems Inc.
12249 Nations Ford Road
Pineville, NC 28134
Tel.: +1 704 971 1240
Fax: +1 704 971 1241
E-mail: info@altocsi.com

1. Use model number, catalog number, and serial number when ordering.
2. Give part number, description, and quantity of parts needed.
3. Give shipping instructions for either freight, UPS, or Parcel Post.

MACHINE CATALOG NUMBERS

575-102CE	228 Ah batt. (3)/12V, 36Vdc Charger, Proex Broom	575-105CE	330 Ah batt. (6)/6V, 36Vdc Charger, Proex Broom
575-103CE	228 Ah batt. (3)/12V, 36Vdc Charger, Nylon Broom	575-106CE	330 Ah batt. (6)/6V, 36Vdc Charger, Nylon Broom
575-104CE	228 Ah batt. (3)/12V, 36Vdc Charger, HD Nylon	575-107CE	330 Ah batt. (6)/6V, 36Vdc Charger, HD Nylon